PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project	
Idaho Model Watershed Habitat Projects	
BPA project number	9401700
Contract renewal date (mm/yyyy)	**12/99**
Multiple actions? (indicate Yes or No)	**yes**
Business name of agency, institution or organization requesting funding	
Lemhi and Custer Soil and Water Conservation Districts	
Business acronym (if appropriate)	LSWCD, CSWCD
Proposal contact person or principal investigator:	
Name	Glenn Seaberg, Project Coordinator
Mailing address	206 Van Dreff Ste A
City, ST Zip	Salmon, ID 83467
Phone	208-756-6322
Fax	208-756-6376
Email address	mws@dmi.net
NPPC Program Measure Number(s) which this project addresses	
7.7B.3, 7.6A.1, 7.6A.2, 7.6B.3, 7.6C.5, 7.8A.2, 7.8D.1	
FWS/NMFS Biological Opinion Number(s) which this project addresses	
NMFS Recovery Plan for Snake River Salmon, task numbers 1.4b, 1.4c, 1.4d, 1.6b Endangered Species Act consultation done on a site specific project by project basis	
Other planning document references	
Idaho Soil Conservation Commission and Bonneville Power Administration. 1995. Model Watershed Plan for the Lemhi Pahsimeroi and East Fork of the Salmon Rivers, Idaho. DOE/BP-2772, Bonneville Power Administration, Portland, Oregon.	
Short description	
To protect, enhance and restore anadromous and resident fish habitat and achieve and maintain a balance between resource protection and resource use on a holistic watershed management basis.	
Target species	
Snake River Spring Chinook salmon, *Oncorhynchus tshawytscha* Snake River Summer Steelhead trout, *Oncorhynchus mykiss* Salmon River Basin Bull trout, *Salvelinus confluentus* Salmon River Basin Cutthroat trout, *Oncorhynchus lewisi*	

Section 2. Sorting and evaluation

Subbasin
Salmon River Subbasin

Evaluation Process Sort

CBFWA caucus		**CBFWA eval. process**		**ISRP project type**	
X one or more caucus		If your project fits either of these processes, X one or both		X one or more categories	
X	Anadromous fish		Multi-year (milestone-based evaluation)	X	Watershed councils/model watersheds
	Resident Fish	X	Watershed project eval.		Information dissemination
	Wildlife				Operation & maintenance
					New construction
					Research & monitoring
				x	Implementation & mgmt
					Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	**Project title/description**

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9202603	Model Watershed Coordination and Administration/Implementation Support	Directly supports the Model Watershed project coordinator, office coordinator, office space, and equipment.
9306200	Salmon River Anadromous Fish Passage Enhancement	A co-project for the Model Watershed project area which specifically addresses physical barriers to anadromous fish passage.
9401500	Idaho Fish Screening Improvement-O&M	A related project to reduce fish mortality in irrigation diversions.
8909800	Idaho Supplementation Studies Information Collection	This project is part of ISS research which is used for monitoring and evaluating anadromous and resident stocks within the Model Watershed project area.
9009	Restore the Salmon River, in Challis, Idaho	This projects area is outside the current MWP area, however it compliments the current habitat and passage projects in the upper Salmon River basin.

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1993	Stabilized 200 yards of streambank on East Fork of the Salmon River.	Reduce sediment levels within spawning gravels
1993	Improved 29 irrigation diversion structures on the Lemhi River.	Reduce the number of physical barriers that hinder migration
1994	experimental “fish flush” conducted by irrigators to allow chinook adults passage to spawning areas on Lemhi River.	Reduce the number of physical barriers that hinder migration
1994	Big Flat Ditch siphon completed to reconnect Carmen Creek to the mainstem Salmon River.	Reduce the number of physical barriers that hinder migration
1995	Riparian enhancement fence completed on 4.5 miles of streambank on two ranches in the Pahsimeroi and three ranches on the Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1995	Point of diversion transferred from the Pahsimeroi River to the Salmon River.	Increase instream flows
1995	Two diversions eliminated on Lemhi River with a combined net savings of 1,600 acre feet of water.	Increase instream flows

1995	Seven irrigation diversions consolidated into three irrigation diversions on Lemhi River.	Reduce the number of physical barriers that hinder migration
1996	Three ranches near Leadore construct fencing and implement grazing/pasture management systems along 5.75 miles of critical stream habitat along Lemhi.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1996	Two canals eliminated from the Salmon River through consolidation into Challis Irrigation Canal.	Reduce the number of physical barriers that hinder migration
1996	Two ranches on East Fork constructed riparian enhancement fences along 1.75 miles of river.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1996	Diversions EF-7 and EF-8 consolidated on East Fork.	Reduce the number of physical barriers that hinder migration
1997	Completed L-3A diversion structure and bypass system.	Reduce the number of physical barriers that hinder migration
1997	Reset pipe on old L-5 diversion to provide off-channel rearing habitat.	Develop new rearing and resting pools.
1997	Constructed 0.75 miles of fence and developed a grazing system for a ranch along the Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1997	Constructed 15 miles of fence on 8.5 miles of the upper Lemhi River along critical chinook spawning and rearing habitat.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks. Reduce sediment levels within spawning gravels.
1997	Streambank stabilization and off-channel rearing site along lower Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks. Develop new rearing and resting pools.
1997	Construction of 0.85 miles of fence on the lower Lemhi stream reach.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1997	Construction of 0.75 miles of fence along Pattee Creek.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1997	Riparian pasture management fencing was constructed on three ranches along 3 miles of the Pahsimeroi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1997	Phase I of a riparian management project on the East Fork installed a series of instream bank stabilization structures.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	At L-8a diversion a headgate, wasteway, and vortex weir were installed to facilitate fish passage and eliminate gravel push up	Reduce the number of physical barriers that hinder migration

	dam.	
1998	Riparian fence along 0.90 miles of the upper Lemhi River and Texas Creek.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	Riparian fence along 1.2 miles of Hayden Creek.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	Riparian fence along 1.0 mile of Eighteenmile Creek a headwater tributary of the Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	Riparian fence and grazing management system along 1.0 mile of Pahsimeroi River/Patterson Creek.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	Riparian fence have been started with 3 landowners along 2.8 miles of the East Fork.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Provide barrier free passage for adult and juvenile fishes	A	Continue efforts to consolidate and improve irrigation diversions.
		B	Continue inventory and mapping fish barriers and monitoring expansion of fish distribution into enhanced areas
2	Develop new resting and rearing pools in areas previously altered	A	Install instream habitat improvement projects i.e. drop structures, boulder placement in areas (Bitterroot Ranch, Big Springs Creek) lacking adequate channel morphology.
		B	Continue providing technical recommendations to groups involved with mitigation projects to direct mitigation efforts to habitat improvement.
3	Enhance and stabilize riparian vegetation communities in critical anadromous spawning and rearing locations.	A	Develop alternative management practices or fence riparian areas and develop grazing plans or conservation easements with private landowners.
		B	Reestablish riparian communities with willow plantings.
4	Expand and restore available anadromous and resident fish spawning and rearing areas	A	Pursue reconnecting tributary streams to mainstem systems (Canyon Creek, Little Morgan Creek, Agency Creek, Pattee Creek) working within

Obj 1,2,3	Objective	Task a,b,c	Task
		B	framework of Idaho water law and landowner management constraints. Work with water users to allow natural tributary flows to reconnect to mainstem rivers during non-use time periods. This may involve educating tributary user of the importance of mainstem connectivity or assisting landowners to improve diversion and water conveyance systems.
5	Reduce sediment levels within spawning gravels.	A	Control access by livestock to steams by fencing and use vegetative plantings.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	01/2000	12/2000	Increased smolt out-migration		5%
2	01/2000	12/2000	Increase number of rearing pools as identified in stream inventory		10%
3	01/2000	12/2000	Achieve proper-function and condition in riparian areas.		40%
4	01/2000	12/2000	Expand available anadromous spawning & rearing areas		20%
5	01/2000	12/2000	stabilize heavily impacted streambanks		25%
				Total	100%

Schedule constraints Participation from landowners to install Best management Practices to benefit the streamside vegetative cover and ultimately the fishery is always uncertain. The current perception of the local Soil and Water Conservation Districts is that if it can be designed to have benefits for the landowner as well as the fish habitat, the landowner will participate. Due to the cooperative nature of the Model Watershed Project, project evaluation can be a complicated and lengthy process. Project scope often changes with the development of consensus, perception of needs, and state and federal permit requirements. Unavailability of technical support can slow down planning needs such as biological assessments and cultural resource clearances. This evolving process makes annual budgeting a difficult task as planners and cooperators become aware of project needs. Also, with annual variation in chinook spawn timing and fish distribution, streamside projects may need to be delayed or expedited accordingly to minimize possible negative impacts to listed species. Further delays may occur to accommodate the management needs of the landowner (i.e. irrigation diversion can't be shut down during critical irrigation periods). Other limiting factors including weather, flooding, and availability of materials can constrain the implementation of projects.
Completion date 2005

Section 5. Budget

FY99 project budget (BPA obligated):	$400,000

FY2000 budget by line item

Item	Note	% of total	FY2000 ($)
Personnel	Project Planner (2088 hrs x $16/hr)	8	$33,408
Fringe benefits	Planner Health Benefits (7.7% of Salary)	0.6	$2,572
Supplies, materials, non-expendable property	Construction materials for fences, bank barbs, plantings, and irrigation improvements	78	$309,954
Operations & maintenance	Landowner responsibility	0	0
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		0	0
NEPA costs	20 projects @ $300	1.5	$6,000
Construction-related support		0	0
PIT tags	# of tags:	0	0
Travel	Planner Travel 1,550 miles x $0.31/mile Boise, ID $95/day x 3 days	0.4	$1,486

	Challis, ID $90/day x 8 trips		
Indirect costs	5% SWCD Overhead	5	$20,000
Subcontractor	Technical Support 640 hours x $11/hr x 2 people Archeological Clearances $250/day x 10 days	4	$16,580
Other	Monitoring and evaluation / GIS	2.5	$10,000
	TOTAL BPA REQUESTED BUDGET		$400,000

Cost sharing

Organization	**Item or service provided**	**% total project cost (incl. BPA)**	**Amount ($)**
Landowner	Labor, Contracting, O&M	30	160,000
ID Fish & Game	Project Funding	10	40,000
Bureau of Reclamation	Project Funding	25	100,000
U.S. Fish & Wildlife	Project Funding	5	20,000
	Subtotal		320,000
	Total project cost (including BPA portion)		$720,000

All amounts in "Cost sharing" table are estimates based on past contributions

Outyear costs

	FY2001	**FY02**	**FY03**	**FY04**
Total budget	$400,000	$400,000	$400,000	$400,000

Section 6. References

Watershed?	**Reference**
	A guide to establishing points and taking photographs to monitor watershed
	Dorratcaque, D. E., 1986. Lemhi River Habitat Improvement Study. BPA contract number DE-AC79-84BP17447, project number 84-28, Portland, OR..
	Feldhausen, S. et. al.1998. Lemhi River Sub-basin Assessment Draft Document.
	Idaho Soil Conservation Commission and Bonneville Power Administration.
	Northwest Power Planning Council. 1994. Columbia River Basin fish and Wildlife Program. Northwest Power Planning Council, Portland, Oregon.
	U.S. Government, Federal Register. (57 FR 14653) Listing of Snake River fall chinook and Salmon River spring/summer chinook as threatened. April 22, 1992. Washington D. C., 57:14653.
	U.S. Government, Federal Register. (59 FR 42529) Reclassification of Snake River fall chinook and Salmon River spring/summer chinook as endangered. August 18, 1994. Washington D. C., 59:42529.
	U.S. Department of Commerce (USDC). National Oceanic and Atmospheric

	Administration (NOAA). National Marine Fisheries Service (NMFS). In Review. Final Recovery Plan for Snake River Salmon.

PART II - NARRATIVE

Section 7. Abstract

The Idaho Model Watershed Project (MWP) was initiated in 1992 by the Idaho Soil Conservation Commission as part of the Northwest Power Planning Council's plan for salmon recovery in the Columbia River Basin. This project is located in Central Idaho and involves three watersheds; the Lemhi River, the Pahsimeroi River, and the East Fork of the Salmon River. The objective of this project is to promote anadromous and resident fish habitat enhancement on private and public land using a watershed approach in the upper Salmon River Basin. The vision of the MWP is to provide a basis of coordination and cooperation between local, private, state, tribal and federal fish and land managers, land owners and others to protect, restore and enhance anadromous fish habitat. Since, the Model Watershed plan was published in November 1995, the MWP has been very successful at planning and implementing habitat enhancement projects while raising the level of understanding of natural resource management centered around fish habitat. The MWP assists landowners in developing plans, funding assistance, and technical advice. The list of accomplishments includes: installation of 35 miles fence to protect over 27 miles of river bank, over 1,084 acres of riparian pasture under grazing management, consolidation of 18 diversion canals, Water Quality Testing project with SCD, River Basin Project to characterize flows and recharge to manage irrigation water and instream flows for fish, 20 structures modified for irrigation water conservation and control, over 4,000 feet of streambank stabilization work.

Section 8. Project description

a. Technical and/or scientific background

Idaho's Model Watershed Project (MWP) is located in the southeast portion of central Idaho. The project area includes drainages from three Salmon River tributaries: the Lemhi, Pahsimeroi and East Fork of the Salmon River. Together these three rivers encompass a 687,533 hectare (1,698,870 acre) drainage area. Elevations range from 1,220 meters (4,000 feet) above sea level to more than 3,048 meters (10,000 feet) on several mountain peaks. The Model Watershed project area averages 23 centimeters (9 inches) of precipitation annually (Idaho Soil Conservation Commission 1995). The climate is characterized by cold winters and warm summers. Air temperatures during the summer can exceed 37.7°C (100°F) and drop below -17.7°C (0°F) in the winter throughout the Salmon River Subbasin.

The Lemhi River runs down the center of a wide, fertile valley. The valley is approximately 4.8 kilometers (3 miles) wide at the mouth gradually narrowing to approximately 0.08 kilometers (½ mile) wide at the town of Lemhi, 54.7 kilometers (34 miles) above the mouth. From Lemhi to Leadore the valley gradually opens out onto a mountain plateau about 8

kilometers (5 miles) wide. The Pahsimeroi River runs down the center of a 6-8 kilometer (4-5 miles) wide valley. The East Fork River drainage is very steep and has a valley floor less than 1.6 kilometers (1 mile) wide. The dominant types of riparian vegetation may include: black cottonwood (*Populus trichocarpa*), alnus, sandbar willow (*Salix exigua*), yellow willow (*Salix lutea*), Booth's willow (*Salix boothi*), Wood's rose (*Rosa woodsii*), red-osier dogwood (*Cornus sericea*), common spike-rush, Baltic rush, carex species, and several pasture grasses. All three watersheds are similar in terms of land use , agricultural operations, native, community interests, and fisheries problems.

Current land ownership and management in the MWP area consists of approximately 95 percent federally managed lands. However, private landowners manage approximately 90 percent of the river flood plains which also encompass the remaining critical habitat for chinook salmon.

Prior to settlement, chinook salmon were a major dietary staple for the Nez Perce, Shoshone, and Bannock Indians who frequented or seasonally inhabited the tributaries of the upper Salmon River. All three tributaries in the MWP area historically produced major salmon runs. It is estimated that 30,000 to 60,000 chinook salmon were harvested annually by tribal fisherman (Peebles 1971). The salmon run was first exploited commercially by the Mormon missionaries who established Fort Lemhi. It is reported in their journals that they exported seven wagon loads of dried salmon to Salt Lake City in 1857 (Nash 1974). Gold discoveries created the first major influx of settlers into the region, closely followed by the emergence of the livestock industry in the 1870's. Cattle herds from Oregon, Utah and Montana were grazed in the mountains in the summer and in the lower meadows in the winter. A severe winter in 1899 brought an end to this practice and ranchers began raising and storing hay for winter feeding (ISCC 1995). Census of Agriculture data indicate that irrigated agriculture acreage has remained virtually the same from 1944 to 1987 in Lemhi County, ranging from 79,211 acres to 77,646 acres.

Since the 1940's, stocks of chinook salmon entering the MWP area have declined precipitously. Many factors contributed to the decline of these fish runs, including hydro power development, hatcheries, over harvesting, and habitat degradation. The five year average for chinook redds from 1960 to 1965 was 1,200 redds for the Lemhi River, 700 redds for the Pahsimeroi River and 775 redds for the East Fork River. During the last five years, the average redd count was 26 redds for the Lemhi River, 14 redds for the Pahsimeroi River and 17 redds for the East Fork River. Given these major population declines habitat degradation and migration problems have been closely scrutinized.

Due to these declines the Snake River spring/summer chinook salmon were listed under the Endangered Species Act as threatened on April 22, 1992 (57 FR 42529) and the Lemhi, Pahsimeroi and East Fork of the Salmon River are all classified as critical habitat (57 FR 14653). To assist in recovery efforts, the Lemhi Model Watershed Project was the outcome of NPPC's "Strategy for Salmon." (NPPC 1991) Their objective is to maximize chinook spawning, rearing and migration through habitat enhancements, while considering current land use practices through a watershed approach.

Upper Salmon chinook runs have persisted for over 10,000 years. Their annual inland migration covers almost 1,448 kilometers (900 miles) and ascends over 1.6 kilometers (1 mile) in elevation. The process of natural selection has equipped local stocks with a unique set of adaptations to survive and return to their natal streams. Over thirty-two different chinook stocks are recognized in Idaho, each specially adapted for persistence in their Subbasin. All remaining stocks of chinook salmon and their habitat are critical to the persistence and recovery of this species.

In January 1993, the Lemhi Model Watershed project became the umbrella for salmon recovery activities for the Lemhi River, Pahsimeroi River and East Fork of the Salmon Rivers. The Model Watershed technical team, comprised of local, state, and federal agencies, determined a fisheries habitat inventory was necessary for all three MWP areas to identify habitat conditions. Recovery actions were prioritized in each drainage based on fish use and habitat conditions and limitations. Inventories were conducted in 1994 on over 193 kilometers (120 miles) of stream in the three drainages, encompassing 9 different river segments. Each drainage was partitioned into different segments based on geological features, unique biological values and past uses or alterations. Each segment was inventoried using modified protocols developed by the Idaho Division of Environmental Quality. Information collected included substrate composition, lengths of habitat units, width and depths at predetermined intervals, cobble embeddedness, spawning potential, and bank stability. At the completion of the inventory the data was analyzed by stream segment and interpreted for width to depth ratio's and slow water to fast water ratio's results of the segment by segment habitat assessment were then compared to other existing biological data (i.e. water flows, temperature, potential barriers) and a list of prioritized goals and actions were developed for each drainage and among the three drainages. These established goals and actions formed the basis of the Model Watershed Plan and have been used as a watershed assessment to direct recovery efforts among the three drainages and river segments. Limiting factors identified through the inventory efforts include: inadequate water flows, excessive water temperatures, lack of bank stabilization and riparian vegetation, elevated sediment levels, and physical barriers to migration.

These limiting factors have been addressed through a series of projects. Removal and consolidation of irrigation diversions and land transfers on the Lemhi River have resulted in the savings of 1,600 acre feet of water. This included the L3A, L4, L5, L-6, L7, and L7A diversions on the lower Lemhi River. Since the completion of this project in 1996 the lower river has yet to be dewatered. Prior to this effort, the river would typically be dewatered from 1 to 6 weeks during dry years. This dewatering coincided with the arrival of adult chinook salmon in August just prior to their spawning in the upper Lemhi River (Bjorn, IDFG). In the Pahsimeroi River a diversion structure was eliminated through water right transfer to the Salmon River on the Parkinson Seed Farm. This reconnected approximately 6 miles of habitat that was previously dewatered and provided barrier free fish migration to higher reaches in the river into good quality spring-fed tributaries.

To address the limiting factors of excessive water temperatures, lack of bank stability, riparian vegetation and elevated sediment levels, the MWP has been involved with riparian protection and rehabilitation through riparian fences and willow planting. Riparian fences have

included one of two management strategies implemented based on the management needs of the landowner. Riparian pastures have either been grazed seasonally to encourage adequate and timely riparian recovery or grazing exclusion with protective easements. Installation of 35 miles of riparian fences to protect over 27 miles of river bank have been implemented to date. Monitoring sites within each project have been established to evaluate the effectiveness of the projects. These monitoring programs include vegetation monitoring, stream width and depth monitoring, temperature monitoring and established photo points. Other biological monitoring occurring includes fish density/composition observations and resident fish spawning ground counts. Since the implementation of habitat projects in the upper Lemhi, numbers of spawners in resident rainbow spawning ground counts have increased over 100% in the three sites monitored (IDFG 1998 in review). This indicates that the benefits of habitat improvements are already being realized. Most other data being collected is long term in nature and will take several years for results to be apparent.

Most of the physical barriers to migration within the MWP was identified as man-made irrigation diversions. Since inception of the MWP, 18 diversions have been consolidated and or modified to improve passage of both adult and juvenile fish. Many of the major barriers noted during the habitat inventory have been addressed and many projects are still in progress in cooperation with the MWP.

For the MWP to be successful it must establish a working relationship with the private landowners and resource users to effectively identify and develop remedial actions for areas of concern on private lands. These remedial actions must be developed with the landowner and their management needs for it to be successful. Local private landowners continue to be very interested in working with the MWP in anadromous fish recovery.

The proposed action of the Lemhi Model Watershed Project is supported by the Final Snake River Salmon Recovery Plan (NMFS, in review) and is addressed in Section 7 of the Columbia River Basin Fish and Wildlife Program (NPPC 1994). Both program support the action of protecting and restoring important habitat on federal and private lands, and protecting watersheds that contain good quality habitat that can be readily restored. The proposed actions of the Lemhi MWP will improve water quality (sediment inputs, temperatures) while benefitting the biological needs of salmon, steelhead, bulltrout, and other fish and wildlife species. In addressing, habitat issues the MWP focuses habitat restoration holistically rather than at the single species level. Any remedial habitat efforts directly benefit several listed or proposed listing fishes. All native trout or salmon species present in all three MWP drainages are or are either proposed for listing.

b. Rationale and significance to Regional Programs

The Lemhi Model Watershed Project (MWP) has direct significance to the Regional Fish and Wildlife Program section 7.6C of the 1994 Columbia Basin Fish and Wildlife Authority. This section specifically addresses model watershed projects and their role in helping to reach the stated goals and objectives. Section 7.6C.1 calls for fisheries, land and water managers to develop a more comprehensive set of habitat performance standards taking into account differences in climate, location, soils, topography and other pertinent factors unique to each area (NPPC 1994). The council included in Table 7-1 the elements of habitat performance standards

to be measured. The Lemhi MWP followed these elements closely when developing its habitat inventory of 120 miles of stream within the MWP and uses aspects of elements for monitoring and evaluation. FWP section 7.7 directly address habitat protection and improvement with private landowners. The Lemhi MWP was designed and does work for cooperative habitat protection and improvement with private landowners. The Lemhi MWP has effectively "bridged the gap" between private, local, state and federal management on a watershed basis. Habitat issues such as spawning, rearing, and migration habitat have been and are still being directly addressed for anadromous and resident fishes and wildlife on private ground. Specifically, sediment, bank stability, water quality, large woody debris, instream flow, and riparian vegetation are targeted by the habitat management objectives.

Measure 7.6A.1 calls for coordination of human activities on a comprehensive watershed management basis. The Lemhi MWP has fostered the coordination of such activities to benefit the fisheries resource. For example, in August 1994 the MWP coordinated an experimental "fish flush" with the Lemhi River Irrigators. Over 100 irrigators voluntarily participated by turning off diversion water for a 12 hour period. The purpose was to determine if a dewatered section of the Lemhi River, below L-7 diversion, would recharge and allow spring chinook salmon adults to migrate upstream. The experiment was deemed a success and allowed private water users to voluntarily participate in salmon recovery. Since the "fish flush" experiment, water users in the dewatered portion of the river have worked with the MWP, local, state, and federal agencies to consolidate and retire diversions in this area. Since completion of the L-6 water conservation project in 1996, this section of river has yet to be dewatered.

Measure 7.6A.2 addresses improved productivity of salmon and steelhead habitat which is critical to the recovery of weak stocks. The Lemhi, Pahsimeroi and East Fork Rivers have been designated as critical habitat (57 FR 14653) and all stocks are presently very depressed. The MWP through its efforts in riparian recovery, bank stabilization, and the removal of physical migration barriers is improving habitat productivity while protecting and enhancing critical habitat. Resident rainbow spawning ground surveys conducted within past project areas have increased 100% since 1994, indicating habitat improvements may be working (IDFG 1998, in printing). In the fall of 1998, record numbers of presmolt spring chinook salmon have been observed at a fish trap operated by the Idaho Department of Fish and Game on the mainstem Lemhi River near the mouth of Hayden Creek (Tom Curet, personal communication). Preliminary indications are that egg to smolt survival rates may be higher in 1998 than in any other year since the study was began in 1993.

Measure 7.6B.6 encourages involvement with volunteers and educational institutions in cooperative enhancement projects. The MWP has been actively involved with Brooklyn Middle School, Pioneer Elementary School, and the Challis, Leadore, and Shoshone-Bannock High Schools working with streamside incubators and living stream classroom projects. During these activities, school children learn the value of working cooperatively on resource projects and become familiar with the accomplishments of the MWP. In 1999, the Leadore High School is planning a bank stabilization project in the upper Lemhi River with the assistance of the MWP. The Challis High School plans to assist the MWP with bank stabilization on the Pahsimeroi River.

c. Relationships to other projects

BPA Project #9202603, Model Watershed Coordination and Administration/ Implementation Support, directly supports the Model Watershed project coordinator, office coordinator, office space and equipment. Habitat and passage projects could not be implemented without this funding.

BPA Project #9306200, Salmon River Anadromous Fish Passage Enhancement, is a co-project for the Subbasin which specifically addresses physical barriers to anadromous fish passage.

BPA Project # 9401500, Idaho Fish Screening Improvement-O&M, is a joint project of the IDFG which enhances passage of juvenile and adult fish in Idaho's anadromous fish corridors by minimizing impacts of diversion dams, screens pump intakes and screens all irrigation canals. Also, consolidation and elimination of irrigation diversion and reconnection of tributaries lost to irrigation canals.

BPA Project # 9009, Restore the Salmon River, in the Challis, Idaho area is outside the current MWP area, however it compliments the current habitat and passage projects in the upper Salmon River basin.

BPA Project #8909800, Idaho Supplementation Studies Information Collection is part of ISS research is used for monitoring and evaluating anadromous and resident stocks within the Model Watershed project area.

d. Project history (for ongoing projects)

The Lemhi MWP was established in 1992 with an Administration budget for coordination and support #9202603. Project contracts were later added in 1993 for fish passage #9306200 and 1994 for fish habitat enhancement #9401700. This project is highly successful due to the cooperation of local landowners, Soil and Water Conservation District boards, government agency personnel and others. It is common to hear, "We all want to see the salmon and steelhead back here and we are willing to do our part."

The MWP Plan was finalized in 1995 and outlines habitat goals and objectives and how to implement. A complete stream habitat inventory was completed in 1994 for all three mainstem rivers. This information helps guide prioritization of projects to best help fish and wildlife. We are currently in the implementation phase with around twenty projects per year constructed from BPA grants among other funding sources. Without continued coordination, the projects would most likely not be implemented or fail in the long-term due to poor communication and understanding.

Results are large in scope as detailed in Section 4, past accomplishments. Many high priority issues identified in the MWP Plan have been resolved. These include major improvements to adult migration barriers in the lower Lemhi and Pahsimeroi Rivers, grazing management on fourteen miles of the Lemhi River and seven miles on the Pahsimeroi River all of which is in active spawning and rearing habitat for salmon/ steelhead. Additionally, a twelve-mile plan has been

developed for the most critical spawning and rearing habitat in the East Fork including bank stabilization, grazing management and irrigation management.

This project is making improvements on one to eight miles of stream habitat with many projects rather than 100 yards at a time. Additionally, BPA funds are only part of the project implementation

e. Proposal objectives

The primary goal of this watershed program is to protect, enhance, and restore salmon habitat, while maintaining a balance between resource protection and use. The MWP strategy has been to first assess resource conditions within each drainage basin, then implement coordinated actions that will help rebuild salmon runs. The Model Watershed Plan (1995) is a critical element of this planning process. Since approximately 90 percent of the occupied salmon habitat in these watersheds is located on private lands, this plan focuses on the habitat problems and opportunities in these areas. Salmon habitat on public lands is being address through other coordinated planning efforts in the area. The Model Watershed Plan (1995) is intended to be a dynamic document that will change over time. Changes are likely to occur as more is learned about the watershed and its processes. Changes may also occur as projects are implemented and evaluated according to plan guidelines, i.e. adaptive management. However, the work accomplished will persist for decades.

Escapement back to the MWP three streams are below a level that maintains the population at current production and rates of return. Projects are aimed at protecting, enhancing and restoring habitat. This program has identified those areas most important for spawning and rearing. Given the limiting factors affecting habitat a series of prioritized objectives and actions were developed. This objectives have been prioritized in the MWP plan according to stream reaches within and between the three watersheds. The objectives include:

1) Provide barrier free passage for adult and juvenile fishes
2) Develop new resting and rearing pools in areas previously altered
3) Enhance and stabilize riparian vegetation communities in critical anadromous spawning and rearing locations.
4) Expand and restore available anadromous and resident fish spawning and rearing areas
5) Reduce sediment levels within spawning gravels.

f. Methods

The resource inventories included in the Model Watershed Plan (1995) identify five factors limiting salmon production in the project area. These inventories identified the following major problems.

1) Inadequate water flows
2) Physical barriers
3) High water temperatures
4) Lack of streamside vegetation
5) High sediment levels

To solve these problems, habitat objectives were established for each watershed that reduce mortality and enhance spawning, rearing and migration habitat in the Lemhi, Pahsimeroi and East Fork of the Salmon Rivers.

1) Increase instream flows during critical fish migration periods,

2) Reduce the number of physical barriers hindering fish migrations,

3) Develop new rearing and resting pools,

4) Establish riparian vegetation along critical areas to provide cover and reduce water temperatures, and

5) Reduce the sediment levels within spawning gravels.

The MWP Plan and habitat inventory breaks each river section into reaches which are further associated with particular limiting factors and issue importance for anadromous fish unique biological values. To accomplish these objectives, contracts are developed with participating landowners on a voluntary basis. The majority of projects are landowner initiated while others are brought forward by agency personnel. After an initial field visit with the project cooperator, project proposals are filled out for the project. Proposals identify objectives, habitat problems, tasks, benefits, and budget needs specific to the project. These proposals are presented to a technical committee composed of resource professionals, who evaluate the project for fish benefit, technical merit, and likelihood of success. The Lemhi and Custer Soil and Water Conservation Districts (SWCD) are responsible for program review and planning review in their respective districts. The local conservation districts are key to the whole process through ensuring local participation and support. There is no other local district or agency that has the local knowledge and leadership to institute change in private land and water management. District leaders know what is socially and economically feasible in their areas. The SWCD's give the final approval for the implementation of proposed projects and disbursement of funds to complete the work. All projects are analyzed under NEPA through the BPA Watersheds Management Program Final EJS and subsequent project NEPA checklists. Through this process all projects are determined to have no significant in advert negative impacts to non-target species populations and species population assemblages.

Project cooperators are responsible for obtaining bids and selecting a contractor to complete project work. They a responsible to obtain all permits, easements, and rights of way. Operation and maintenance of MWP habitat restoration projects is the responsibility of the private landowners. Long-term operation and maintenance of the project will continue for the time period specified in the landowners contract with the SWCD.

Projects may involve a variety of work methods addressing the tasks listed in Section 4. The approach and methods for any given restoration project are individually developed using available technical expertise and landowner objectives. In general, preferred methods of accomplishing given restoration objectives are to allow, or to encourage natural processes to do most of the restoration work over time.

Objective 1 as listed in Section 4 will be met through the cooperative funding efforts of

BPA Project #9306200, Salmon River Anadromous Fish Passage Enhancement, and with supplemental funding from Idaho Department of Fish and Game and possibly the Bureau of Reclamation. Efforts will continue to inventory and map fish barriers and to consolidate and improve irrigation diversions in the Lemhi, Pahsimeroi, and East Fork Rivers.

Objective 2 and 4 as listed in Section 4 will be met through the development of plans to enhance or create rearing and resting habitat, including rootwad placement, drop structures to create pools, developement of irrigation canals as rearing habitat, and reconnections of historical habitat. Many of these strategies will be accomplished as part of larger habitat projects.

Objectives 3 and 5 as listed in Section 4 will be met through the development and implementation of ranch management plans on private lands. These plans will have the support and commitment of the landowners and will include grazing and riparian best management practices including: fencing of critical areas, stream channel vegetation, offsite water development, and planned grazing systems. Streambank stabilization projects, where appropriate, will be undertaken to reduce sediment delivery from bank erosion. Stabilization may utilize a combination of vegetation planting and rock bank barbs or root wads.

Funding will provide the necessary materials, and cost sharing for equipment use. In-kind matching funds for labor will be provided by the landowner.

The cost of establishing grazing systems is approximately $30 to $50 per acre. This is the average cost to develop the pasture rotation using cross fencing, seedlings, and water developments. Progress towards the objectives is slower under this strategy, and monitoring and evaluation costs would be higher. Most expenses are a one-time cost, although there may be some ongoing maintenance costs.

Material for corridor fencing can cost as much as $30,000 per mile for fencing (both sides of the stream). Limited costs would also be associated with the monitoring and evaluation. This strategy has proven in the past to make rapid progress towards achieving the objectives of establishing riparian vegetation and reducing sediment levels. The purpose of installing corridor fencing is to remove grazing pressure away from riparian plant communities such as *Salix* spp. and *Carex* spp. which provide bank stability and therefore reduce sedimentation as well as providing a filter for nutrients. Well vegetated streambanks also provide valuable cover for fish and wildlife and shade which keeps mid-summer water temperatures within acceptable ranges for cold water fish

Other strategies may include the costs associated with set-aside or conservation reserves which is approximately equal to the value of forage foregone by not grazing the bottom pastures. Estimated annual rental fees for a 10-year contract would be about $36 to $45 per acre. Implementing any of these strategies requires technical staff assistance.

Approach. Since approximately 90% of the critical migration, rearing and spawning habitat is located on private ranch land there is a great concern for achieving and maintaining a

balance between resource protection and resource use on a holistic watershed management basis.

Although each watershed is different, the habitat problems and solutions are often very similar. One important distinction, however, is that all problems are not equal in terms of their impact on fisheries production. This is true for problems in the same watershed , and when problems and opportunities are compared between the three watersheds. Given these considerations, a series of *prioritized* objectives and actions have been developed to address each of the major habitat problems.

Critical Assumptions.

1) The hypothesis is that increasing the quantity and quality of vegetation along the sixty miles of fair to good quality habitat in the three river basins will increase the egg to smolt production of anadromous and resident fish in these waters from the current seven to nine percent to fifteen to twenty percent.
2) Riparian vegetation will improve fish habitat by restoring instream and overhead cover, enabling the development of undercut banks, and reducing water temperatures through shading.
3) Deep and dense root systems will increase bank stability and reduce erosion thereby decreasing fine silts in spawning gravels.
4) Establishing protected riparian corridors along critical fish habitat areas can provide cover for rearing fish, help reduce water temperatures, stabilize streambanks, and reduce cobble embeddedness.

Strategies. The following strategies have been used to achieve the Model Watershed Project objectives:

- corridor fencing and implementation of best management practices
- grazing systems which include riparian pastures
- set-aside or conservation reserves of whole pastures that include the stream corridor
- streambank stabilization with willow planting and bank barbs

Habitat inventories indicate there is sufficient quantity of spawning and rearing habitat within the Lemhi watershed to support the desired level of salmon recovery. However, there are opportunities to improve the quality of this habitat which would help increase production levels.

Ranch management plans referenced in Section 4 include best management practices which will limit access and where necessary exclude livestock from riparian areas and streambanks during periods of streambank and vegetative vulnerability. The effect will be to provide plant cover to decrease water temperatures and stabilize stream banks to abate the delivery of sediment to spawning gravels.

Irrigation diversions present a barrier to fish migration as well as diverting smolts from the stream to irrigated pasture. Traditionally, in-stream berms are constructed to guide irrigation water to diversion point each season. This activity is a direct disturbance to areas potentially used for spawning.

Monitoring and Evaluation: The Model Watershed Plan (1995) outlines a series of actions designed to improve fish habitat conditions within the three target watersheds of the Lemhi, Pahsimeroi, and East Fork of the Salmon rivers. The ultimate goal is to restore fish numbers to levels that were present in the 1960's.

This plan conducts monitoring on three different levels. *Baseline monitoring* is conducted to characterize existing conditions and to establish a database for planning or future comparisons. *Implementation monitoring* which includes projects which have been implemented and whether projects were implemented as planned. It asks the question, Did we do what we said we would? The third level of monitoring focuses on *effectiveness monitoring* which measures the effects on specific habitat parameters, such as

- sediments in spawning gravels
- water temperatures in relation to ambient air temperature
- stream flows in critical sections

- streambank stability
- water quality
- riparian cover

Detailed habitat inventories were conducted in a 1994 Habitat Survey to establish baseline data and monitor future changes. Water temperature data is collected year around using 100 HOBO data loggers. The data is collected through the interagency cooperation of the Model Watershed Technical Committee including Forest Service, Bureau of Land Management, Idaho Fish & Game, the Bureau of Reclamation, and Shoshone-Bannock Tribes, Department of Environmental Quality and others. Fish populations are evaluated annually by the IDFG through snorkel and redd counts.

Existing guidelines such as *Monitoring Protocols to Evaluate Water Quality Effects of Grazing Management on Western Rangeland Streams* and *Idaho Water Quality Monitoring Protocols* will be used to identify monitoring parameters and strategies. All projects will include an individual monitoring and evaluation plan that identifies specific monitoring parameters and the responsible monitoring entity. For example, if an action proposes a pasture management system to enhance riparian vegetation, then changes in plant cover will be monitored using greenline methods to evaluate this action.

All sites are documented with photographs during the scouting phase of the project. Photo-points are used to document visual changes in channel stability and riparian vegetation. Completed projects are photographed annually at a time consistent with previous photographs, using established photo-points. Project monitoring results are reviewed annually . As the monitoring program evolves, the program is expanding to embrace G.P.S. technology, establish photo points and GIS compatibility. This allows more effective planning for projects and mapping data. We are working with the Grande Ronde Model Watershed Project to develop a project database using Paradox software. This will improve storage and access to project monitoring data and the ability to more effectively compare and evaluate projects.

g. Facilities and equipment

Administration and coordination funding for the Model Watershed Project is provided through BPA contract # 9202603 through the Idaho Soil Conservation Commission. Part of this funding provides office space, phone, fax, copier, meeting table, desks, file cabinets, monitoring camera, computers, computer software, and a vehicle. Other equipment and facilities are shared with other agencies. Without the coordination funding and the help from other agencies and entities, the site-specific projects would not be implemented.

h. Budget

Personnel - The project planner is employed for the MWP by the Lemhi and Custer SWCD's through habitat funding. This position allows close contacts with the SWCD's and private landowners in both Disticts. A portion of the planner's salary was paid through the Administrative budget in 1999. Placing the entire amount in the Habitat budget will simplify our bookkeeping process and be more efficient.

Fringe Benefits - Provide health insurance benefits for planner.

Supplies, materials, non-expendable property - This amount reflects approximate expenses for fence supplies, (posts, poles, wire, spikes, clips, gates, etc.) streambank protection (planings, vegitations, rock), irrigation improvement (headgates, sprinklers, canal reconstruction), off-stream water systems (wells, pipelines, troughs).

Operation and Maintenance - The landowners shoulder the responsibility expenses for O&M. This is calculated on some projects as part of the landowners cost-share. For the projects to be successful, they need to "buy into" and take care of the improvements. This concept is one of the reasons our program has been successful.

Capital Acquisitions - the MWP has no plans for these expenses from the habitat budget.

NEPA Costs - To fullfil NEPA requirements, additional staff time or seperate contractors are required.

Construction Related Support - Habitat improvements require labor, machinery and equipment to install practices. Most projects are cost-shared for the labor with the landowner providing the lions share of construction costs.

PIT Tags are not pertinant to our project at this time.

Travel - will allow planner to attend training, seminars and meetings as necessary. The isolation of the Salmon River Valley makes it expensive but very important to attend these events.

Indirect Costs - The Lemhi and Custer SWCD's provide billing, contracting and clerical support for habitat projects. This amount reflects the additional time, audits, and bookkeeping expenses incurred by the Districts. The District Boards are esential in getting the projects funded and maintain a close contact for construction and operation and maintenance.

Subcontractors - Additional technical support is necessary for surveys, designs, implementation, and monitoring of projects. This is usually for specific sites on a contract bases. The large amount of projects undertaken makes in impossible for the limited staff to cover all of these items. When archeological clearances are required for projects, an archeologist is hired on a contract basis. Several projects are lined up at one time to make the most cost-effective use of their time.

Other - Monitoring and evaluation and GIS support has reached a new demension with documented accountability for all projects. This funding is to provide further inventory of the watersheds and update the MWP Plan. This will reflect watershed assessments and plan new watershed actions.

Section 9. Key personnel

Glenn Seaberg, Project Coordinator, Full Time
Duties: Implements "Model Watershed Plan" on a watershed scale. Works with MWP Advisory Committee and Technical Team to identify and evaluate the impacts of all proposed and implemented actions to fish habitat and fish passage projects on a watershed scale. Provide coordination and leadership in an integrated effort of watershed management on private and public lands. Works with other agencies and landowners in evaluating the impacts of all proposed and implemented actions on watershed management. Supervises office coordinator and project planner. Coordinates and manages funding and budget expenditures for MWP. Assists participants in grant proposals and funding needs for watershed projects. Prepares work plans and budgets for administration, passage, and habitat projects in coordination with the Custer and Lemhi Soil & Water Conservation Districts.

Katie Slavin, Office Coordinator, ½ time or 85 hours a month.
Duties: General office duties including meeting minutes, agendas, filing, computer data entry, and correspondence. Also responsible for newsletters, news releases, and poster board display. Finalizes quarterly reports to BPA and assists with preparation of work plans and budgets.

Allen Bradbury, Project Planner, Lemhi Soil Conservation District employee (Full Time)
Duties: Assist Project Coordinator with planning and implementation of projects at all phases. Collect information and data on projects, meet with landowners or landmanagers and negotiate contracts for funding. Monitors past and on-going projects and follow-up with funding agencies and landowners.

Kathy Weaver, SCC Program Coordinator, 5% of staff time dedicated to MWS
Duties: Assist with meeting facilitation, information and education consultation and training to MWP Coordinator and Clerk.

Biff Burleigh, SCC Project Specialist, 5% of staff time dedicated to MWS
Duties: Perform liaison between SCC, SCD's, NRCS, and Project Coordinator. Assist Coordinator with progress reports and assess project needs as requested.

SCC Secretarial, SCC staff support clerical, Temporary, part time.

Duties: Employee is responsible for processing and paying all MWP expenses including salaries, office rent, travel, supplies, and equipment leases. All financial transactions are paid from Boise SCC office.

Section 10. Information/technology transfer

The MWP has an aggressive information and education program. The MWP office publishes three newsletters per year which are mailed to all postal patrons in Lemhi and Custer counties plus many other interested parties. Three to four tours of MWP project sites are conducted which are attended by state representatives, county commissioners, interested citizens, agency personnel. All three MWP office employees participate in public speaking and presentations to elementary school children, community members, government officials, and university professors.